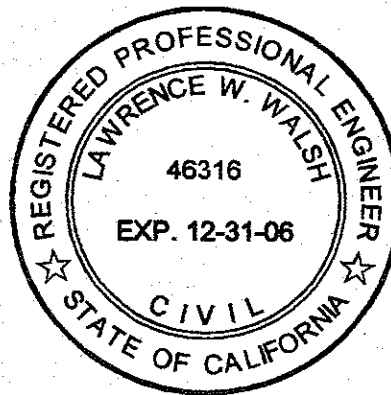




**WALSH ENGINEERING
& SURVEYING, INC.**

STORMWATER MANAGEMENT PLAN

West Lilac Farms Tentative Map 5276



Signature of Preparer: Lawrence Walsh

Date

Prepared for:
James D. Pardee, Jr.
267 Stonecreek Court
Westlake Village, Ca 91361
(Walsh Engineering Job No 01246)

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION

- 1.1 Topography and Land Use**
- 1.2 Hydrologic Unit Contribution**

2.0 Water Quality Environment

- 2.1 Beneficial Use**
 - 2.1.1 Inland Surface Waters**
 - 2.1.2 Ground Water**

3.0 CHARACTERIZATION OF PROJECT RUNOFF

- 3.1 Existing and Post-Construction Drainage**
- 3.2 Post-Construction Expected Discharges**
- 3.3 Soil Characteristics**

4.0 MITIGATION MEASURES TO PROTECT WATER QUALITY

- 4.1 Construction BMPs**
- 4.2 Post-Construction BMPs**
 - 4.2.1 Site Design BMPs**
 - 4.2.2 Source Control BMPs**
 - 4.2.3 Treatment Control BMPs**

5.0 OPERATION AND MAINTENANCE PROGRAM

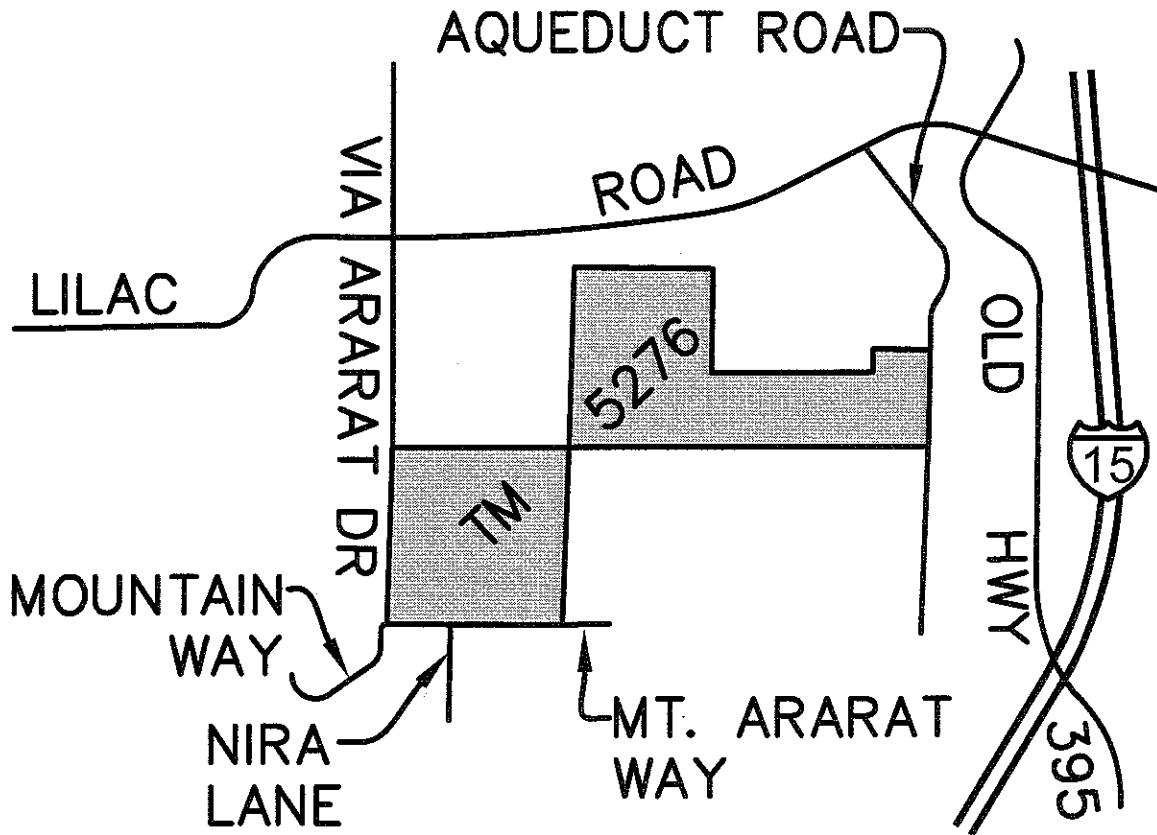
- 5.1 Bio-filters**
- 5.2 Energy Dissipators**

6.0 FISCAL RESOURCES

7.0 CONCLUSIONS

ATTACHMENTS:

- **A. Location Map**
- **B. Project Map**
- **C. Via Ararat Drive Map**
- **D. Aqueduct Road Map**
- **E. BMP Plans (On-site)**
- **F. BMP Plans (Off-site, Via Ararat Drive)**
- **G. BMP Plans (Off-site, Aqueduct Road)**
- **H. On-site Soils Group Map**
- **I. Off-site Soils Group Map**
- **J. BMP Maintenance Indicator**
- **K. BMP Data Sheets**
- **L. Estimated Operation and Maintenance Costs for BMPs**
- **M. Attachment G-3**
- **N. Typical Section of Bio-Filtration Area**



VICINITY MAP

NO SCALE

THOMAS BRO MAP NO. 1048, G-7 & H-7
AND NO. 1068, G-1 & H-1

EXHIBIT A:
VICINITY MAP

INTRODUCTION

The Stormwater Management Plan (SWMP) is a requirement of the County of San Diego under its Watershed Protection, Stormwater Management, and Discharge Control Ordinance (section 67.817). The purpose of this SWMP is to address the water quality impacts from the proposed West Lilac Farms subdivision (TM 5276). Best Management Practices (BMPs) will be implemented to mitigate potential water quality impacts from the development of this project. This SWMP is also intended to provide proper long-term BMP maintenance guidelines based on fiscal planning to ensure their effectiveness. The engineer will revise this SWMP throughout the life of the project as necessary.

1.0 PROJECT DESCRIPTION

The proposed West Lilac Farms subdivision encompasses approximately 93 acres in the County of San Diego, community of Bonsall. The project site is located westerly of Interstate 15 (I-15) and southerly of Lilac Road between Via Ararat Drive and Aqueduct Road (see Attachment A). Several unpaved roads provide access to the groves. There are two paved roads, Via Ararat Drive and Aqueduct Road, which parallel the westerly and easterly project boundaries. The project proposes improvements to both Aqueduct Road and Via Ararat Drive. The improvements consist of widening both roads to 24' wide and adjusting the vertical alignment to meet 25 mph design standards (See Attachments C & D).

1.1. Topography and Land Use

In its existing condition, the site is characterized by rolling hills, approximately 80 percent of which is primarily land uses of irrigated citrus and avocado groves with occasional orchard weeds. Land use for the 28-lot subdivision is rural-residential with a minimum lot size of 2.0 acres. Several existing homes, plant farms and grove areas surround the project.

1.2. Hydrologic Unit Contribution

West Lilac Farms is located in the San Luis Rey Hydrologic Unit (903.00), Lower San Luis Rey Hydrologic Area (903.10), and Moosa Hydrologic Sub-Area (903.12). Approximately one-half of the project drains northwesterly in an unnamed swale and ultimately to the San Luis Rey River, which is located approximately two miles from the project boundary. The remaining portion of the project drains southwesterly in an unnamed swale and ultimately to Moosa Canyon Creek, which is located approximately 1.4 miles from the project boundary. Moosa Canyon Creek and the San Luis Rey River confluence approximately 2.5 miles westerly of West Lilac Farms.

The estimated total drainage area to the San Luis Rey River downstream of the confluence with Moosa Canyon is 355.6 square miles (227,584 acres) and the estimated 100-year storm peak discharge at this confluence is 48,000 cubic feet per second (CFS). This project represents much less than 0.1% of the total contributing watershed area and the total 100-year storm peak discharge at this point in the San Luis Rey River.

The estimated total drainage area to Moosa Canyon Creek at U.S. Highway 395 is 29.2 square miles (18,688 acres) and the 100-year estimated storm peak discharge at this point is 11,550 CFS. This project represents approximately 0.3 % of the total contributing watershed area at this point in Moosa Canyon Creek and less than 2% of the total 100-year storm peak discharge.

The proposed project will not significantly alter the onsite drainage patterns and will not divert storm runoff from its existing watershed. Storm runoff from proposed street areas will be conveyed rapidly to the onsite swales and will flow relatively shallow within the swales. Storm runoff from the residential lots will be conveyed slowly overland through existing and proposed landscaped areas to the swales. Runoff velocities within the swales will not be significantly impacted by the proposed project. The two larger swales located within the project boundary will be dedicated as biological open space areas and will be preserved in the natural, existing condition.

2.0 WATER QUALITY ENVIRONMENT

2.1 Beneficial Uses

The potential beneficial uses are defined as follows:

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR – Agricultural Supply: Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for ranch grazing.

IND – Industrial Services Supply: Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

REC1 – Contact Recreation: Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing and the use of natural hot springs.

REC2 – Non-Contact Recreation: Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact

with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

WARM – Warm Freshwater Habitat: Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

WILD – Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g. mammals birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

2.1.1 Inland Surface Waters

The inland surface waters beneficial uses for hydrologic unit 903.12 are presented in Table 1 and the groundwater beneficial uses for hydrologic subarea 903.10 are presented in Table 2, as presented in the Water Quality Control Plan for the San Diego Basin.

Inland Surface Waters have the following beneficial uses as shown in Table 1:

TABLE 1

HYDROLOGIC UNIT NUMBER	M U N	A G R	I N D	R E C 1	R E C 2	W A R M	W I L D
903.12	+	x	x	x	x	x	x

+Excepted from MUN

x Existing Beneficial Use

0 Potential Beneficial Use

2.1.2 Ground Water

Ground Water beneficial uses include agricultural and potential municipal and industrial. None of these beneficial uses will be impacted due to the construction of this project. Table 2 presents the ground water beneficial uses.

HYDROLOGIC UNIT NUMBER	M U N	A G R	I N D	R E C 1	R E C 2	W A R M	W I L D
903.10	x	x	x				

TABLE 2

*Excepted from specific Beneficial Use

x Existing Beneficial Use

0 Potential Beneficial Use

3.0 CHARACTERIZATION OF PROJECT RUNOFF

3.1 Existing and Post-Construction Drainage

According to the California 2002 303d list published by the San Diego County Regional Water Quality Control Board, there are no impaired waterbodies associated with this project.

- The project location and watersheds have been compared to the current published 303d list of impaired water bodies and the nearest impaired water body is the Pacific Ocean, impaired by High Coliform Count

The estimated 100-year storm event storm peak discharges for the existing and proposed conditions of the watershed which encompasses the on & off-site were determined using criteria set forth in the County of San Diego Hydrology Manual. The criteria as presented in the County's manual for calculating the storm peak discharges from the project site indicate that the runoff coefficient for the existing and proposed conditions remain the same. Therefore, the total storm peak flows from the project site in the existing and the proposed condition remain generally unchanged. The hydrologic calculations and references are included in the "Drainage Study for West Lilac Farms Tentative Map 5276", prepared by Walsh Engineering and Surveying, Inc. on May 24, 2004 and the "Drainage Study for Aqueduct Road & Via Ararat Drive in connection with West Lilac Farms Tentative Map 5276", prepared by Walsh Engineering and Surveying, Inc. on May 25, 2005.

The estimated on- & off-site 100-year storm peak discharges are presented in Table 3.

TABLE 3: 100-YEAR STORM EVENT

DRAINAGE BASIN NO.	EXISTING CONDITION		PROPOSED CONDITION	
	DRAINAGE BASIN AREA (AC.)	Q (CFS)	DRAINAGE BASIN AREA (AC.)	Q (CFS)
1	16	34	16	34
2	57	115	57	119
3	6	16	7	19
4	5	13	5	13
5	4	11	5	15
6	7	18	6	15
7	43	97	42	96

**TABLE 3a: 100-YEAR STORM EVENT
FOR VIA ARARAT DRIVE**

DRAINAGE BASIN NO.	EXISTING CONDITION		PROPOSED CONDITION	
	DRAINAGE BASIN AREA (AC.)	Q (CFS)	DRAINAGE BASIN AREA (AC.)	Q (CFS)
1	2.9	4.5	2.95	4.7
2	0.7	1.1	0.7	1.1
3	1.6	2.5	1.62	2.6
4	1	2.2	1	2.2
5	14.4	20.9	14.47	21.5
6	0.2	0.5	0.21	0.6
7	0.8	1.5	0.8	1.5

**TABLE 3b: 100-YEAR STORM EVENT
FOR AQUEDUCT ROAD**

DRAINAGE BASIN NO.	EXISTING CONDITION		PROPOSED CONDITION	
	DRAINAGE BASIN AREA (AC.)	Q (CFS)	DRAINAGE BASIN AREA (AC.)	Q (CFS)
1	1.3	2.4	1.33	2.5
2	0.8	1.5	0.83	1.8
3	0.8	3.0	0.83	3.1
4	3.7	14.4	3.82	15.1
5	0.14	0.6	0.13	0.8

The on- & off-site runoff volumes for the water quality design storm (85th Percentile) are presented in Table 4.

TABLE 4: 85th PERCENTILE STORM

BASIN	BASIN AREA (Acres)	VOLUME (Acre-inches) P₈₅=0.81"	Q (CFS) (I=0.2 in/hr)	DISCHARGE POINT
1	16	5.3	1.3	Onsite Vegetated Swale to Moosa Canyon Creek
2	57	18.9	4.7	Onsite Vegetated Swale to Moosa Canyon Creek
3	6	2.0	0.5	Overland to Offsite Vegetated Swale to Moosa Canyon Creek
4	5	1.7	0.4	Overland to Offsite Vegetated Swale to San Luis Rey River
5	4	1.3	0.3	Overland to Offsite Vegetated Swale to San Luis Rey River
6	7	2.3	0.6	Overland to Offsite Vegetated Swale to San Luis Rey River
7	42	13.9	3.4	Onsite Vegetated Swale to San Luis Rey River

TABLE 4a: 85th PERCENTILE STORM FOR VIA ARARAT DRIVE

BASIN	BASIN AREA (Acres)	VOLUME (Acre-inches) $P_{85}=0.81''$	Q (CFS) ($I=0.2$ in/hr)	DISCHARGE POINT
1	2.95	0.8	0.19	Overland to 12" CMP to Vegetated Swale then to San Luis Rey River
2	0.7	0.2	0.04	Overland to 12" CMP to Vegetated Swale then to San Luis Rey River
3	1.62	0.5	0.11	Overland to Road surface to Driveway to Vegetated Swale then to San Luis Rey River
4	1	0.3	0.07	Overland to 12" HDPE to Vegetated Swale then to San Luis Rey River
5	14.47	4.1	1.01	Overland to Road Surface to Spillway to Vegetated Swale then to San Luis Rey River
6	0.21	0.1	0.02	Overland to Road Surface to Vegetated Swale then to San Luis Rey River
7	0.8	0.2	0.06	12" HDPE to Vegetated Swale then to San Luis Rey River

TABLE 4b: 85th PERCENTILE STORM FOR AQUEDUCT ROAD

BASIN	BASIN AREA (Acres)	VOLUME (Acre-inches) P₈₅=0.81"	Q (CFS) (I=0.2 in/hr)	DISCHARGE POINT
1	1.33	0.4	0.10	Overland to Road Surface to Vegetated Swale then to Moosa Canyon Creek
2	0.83	0.2	0.05	Overland to Road Surface to Vegetated Swale then to Moosa Canyon Creek
3	0.83	0.5	0.12	Overland to Road surface to Vegetated Swale then to Moosa Canyon Creek
4	3.82	2.0	0.49	Road Surface to Vegetated Swale then to San Luis Rey River
5	0.13	0.1	0.02	Overland to Road Surface to Vegetated Swale then to San Luis Rey River

The weighted runoff coefficient used for both the existing and proposed conditions is 0.41 for on-site. The weighted runoff coefficients used for offsite for both existing and proposed conditions is 0.32 for soil type "B" and 0.36 for soil type "C", for residential-rural (lots greater than 0.5 acres) land uses, as presented in the County of San Diego Hydrology Manual. Theoretically, the development of any site will cause an increase in runoff. However, the potential increase in runoff attributed to this development is negligible because the runoff coefficient and characteristics will not be significantly altered. In addition, storm runoff from the proposed paved street areas will flow rapidly in the pavement and will typically peak and pass sooner than the overland surface runoff from the residential pads and landscaped and grove areas. Therefore, there are no increased storm peak discharges attributed to this proposed development.

3.2 Post Construction Expected Discharges

There is no sampling data available for the existing site condition. In addition, the project is not expected to generate significant amounts of non-visible pollutants. However, the constituents which are commonly found on single-family residential developments and streets are presented in Table 5.

TABLE 5

Anticipated and Potential Pollutants Generated by Land Use Type

<i>Priority Project Categories</i>	<i>General Pollutant Categories</i>								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P ⁽¹⁾	P ⁽²⁾	P	X
Commercial Development >100,000 ft ²	P ⁽¹⁾	P ⁽¹⁾		P ⁽²⁾	X	P ⁽⁵⁾	X	P ⁽³⁾	P ⁽⁵⁾
Automotive Repair Shops			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft ²	X	X			X	X	X		X
1.1.1 Parking Lots	P ⁽¹⁾	P ⁽¹⁾	X		X	P ⁽¹⁾	X		P ⁽¹⁾
Streets, Highways & Freeways	X	P ⁽¹⁾	X	X ⁽⁴⁾	X	P ⁽⁵⁾	X		
X = anticipated P = potential (1) A potential pollutant if landscaping exists on-site. (2) A potential pollutant if the project includes uncovered parking areas. (3) A potential pollutant if land use involves food or animal waste products. (4) Including petroleum hydrocarbons. (5) Including solvents.									

3.3 Soil Characteristics

The project area consists of hydrologic soil group types "B", "C" and "D".

Soil group Type "B" is described as having a moderate runoff potential. These soils have a moderate infiltration rates when thoroughly wetted and consist primarily of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. Approximately 15% of the project site consists of soil group Type "B".

Soil group Type "C" is described as having slow infiltration rates when thoroughly wetted, consisting chiefly of soils with a layer that impedes the downward movement of water and/or of soils with a moderately fine to fine texture and a slow infiltration rate. These soils have a slow rate of transmission. Approximately 50% of the project site consists of soil group Type "C".

Soil group Type "D" is described as having a very slow infiltration rate when thoroughly wetted, consisting chiefly of clay soils with a high swelling potential, soils with a high permanent water table, soils with a clay pan or clay layer at or near the surface and shallow soils over nearly impervious materials. These soils have a very slow rate of transmission. Approximately 35% of the project site consists of soil group Type "D".

The Hydrologic Soil Groups – runoff potential Maps are included in the Reference section of this SWMP as Attachment H for On-site and Attachment I for Offsite..

4.0 MITIGATION MEASURES TO PROTECT WATER QUALITY

BMPs will be implemented during construction and in the post-construction period to minimize impacts to water quality.

4.1 Construction BMPs

Construction BMPs include rip rap energy dissipators, silt fence, gravel bags, brow ditches, bonded fiber matrix (BFM) slope protection and stabilized construction entrances. In addition, the contractor will be responsible for implementing temporary BMPs such as stockpile management, solid waste management, dewatering operations, vehicle and equipment maintenance, material delivery and storage, spill prevention and control, concrete waste management, water conservation practices, paving and grinding operations.

Permanent revegetation of all disturbed uncovered areas will also be implemented.

4.2 Post-construction BMPs

Pollutants of concern as noted in Section 3.2: Post Construction Expected Discharges will be addressed through three types of BMPs. These types of BMPs are site design, source control and treatment control.

4.2.1 Site Design BMPs

The project is designed to minimize the use of impervious areas. Streets are designed to meet the County of San Diego's minimum width criteria and multiple access points are provided through the use of cul-de-sacs, thereby reducing the lengths of the streets. The streets will have a paved width of 24-feet; on-street parking is not allowed. To the maximum extent practicable, future driveways will be designed to drain to landscaped areas to promote pollutant removal prior to discharging to the private road.

There are no proposed underground stormwater conduits other than short reaches for pad drainage and culvert undercrossings. Rip rap energy dissipators will be located at all storm drain and spillway outfalls. No culverts, rip rap energy dissipators, storm drain facilities, landscaping or stormwater facilities will be located within the proposed biological open space areas. The wetlands within the open space are to remain in the natural condition.

The natural drainage swales to which the project site drains are well vegetated with seasonal weedy plants and grasses. These swales within the project boundary will facilitate overland flow and provide filtration and infiltration for storm runoff.

The proposed single-family residences will be setback from the impervious streets to provide opportunities to drain rooftops into landscaped areas, thereby minimizing the directly connected impervious areas. The increased impervious areas will be minimized to the maximum extend practicable for single-family developments. As soon as cuts or embankments are completed, all slopes will be stabilized with a hydromulch mixture, or an equivalent protection measure.

4.2.2 Source Control BMPs

Source control BMPs will be emphasized through homeowner education and implementation. Homeowners will be provided with pamphlets and publications (e.g. "Stormwater Runoff Pollution Prevention Tips for Homeowners") at the time of purchase. The "Stormwater Runoff Pollution Prevention Tips for Homeowners" pamphlet provides guidelines for homeowners to reduce oil, grease and organic compounds through car care maintenance, reduce sediments and nutrients through proper yard care and

maintenance, reduce pesticides and oxygen demanding substances in the home and reduce trash, debris and bacteria and viruses through proper litter and pet waste removal. The pamphlet identifies the sources of stormwater pollution and provides methods and procedures by which the homeowner can alleviate these pollutants.

Homeowners will also be responsible for keeping their driveways swept and for debris removal. Trash cans are to be covered.

4.2.3 Treatment control BMPs

The proposed project is comprised of rural residential homes with minimum lot sizes of two acres. With the exception of the access roads and residential pads, the majority of the existing orchards and vegetation will be preserved. Storm runoff from the access roads will surface flow to proposed spillways. Storm runoff will be conveyed under the access roads through culvert undercrossings. Rip rap energy dissipators will be located at the outfalls of the proposed spillways and at the culvert undercrossings to provide runoff velocity reduction. Street runoff will then be routed overland through landscaped and vegetated areas prior to entering the existing vegetated swales.

Roof drains on all homes to be constructed will deposit into landscaped areas and the runoff will be required to flow overland through the landscaping prior to entering the swales. Recognizing that pollutants from all onsite runoff from the lots will have been adequately filtered through the landscape and the natural swales, potential pollutants will be minimal. In addition, the approximately 65% of the site is characterized by Hydrologic Soil Group Types "B" and "C" which will naturally promote infiltration.

Runoff from the private streets will be deposited into vegetated bio-filtration areas. The bio-filtration areas will be located in natural areas adjacent to the streets. The bio-filtration areas, which utilize both soil and plants to remove storm water pollutants, will slow the runoff velocity and distribute the runoff through the vegetation to remove pollutants and minimize erosion. The locations of the bio-filtration areas will alleviate environmental impacts to the biological open space and wetlands.

The existing natural drainage swales are vegetated with seasonal vegetation. Velocities in the swales are estimated to be relatively slow and will thereby promote the settling or filtering out of pollutants. Biofiltration and infiltration are very efficient treatment control BMPs (see Attachment G-3: Enhanced Treatment Control BMP Selection Matrix in the References Section of this SWMP).

The storm runoff from the project will be sufficiently filtered through the landscape, bio-filtration areas and vegetated swales. The long configuration of the swales together with the vegetation will promote pollutant removal and reduce erosion. Therefore, the bio-filtration areas and vegetated swales will be adequate to filter the design storm runoff and to offset the effect of the typical increase in impermeable surface area common with development. Placements of the BMPs are noted on the BMP plan (Attachments E,F, & G).

5.0 OPERATION AND MAINTENANCE PROGRAM

After construction is complete and lots are sold, the new lot owners will assume the responsibility for maintenance of the private facilities. The designated responsible party may be the lot owners or an association of property owners whose fiscal resources are drawn from private funds or association fees.

The operation and maintenance requirements for specific BMPs are as follows:

5.1 Bio-Filters

The operational and maintenance needs of a biofilter or swale are:

- Vegetation management to maintain adequate hydraulic functioning and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.
- Trash, debris, grass trimmings, tree pruning, and leaf collection and removal to prevent obstruction of a Swale and monitoring equipment.
- Removal of standing water, which may contribute to the development of aquatic plant communities or mosquito breeding areas.
- Removal of graffiti.
- Preventive maintenance on sampling, flow measurement, and associated BMP equipment and structures.
- Erosion and structural maintenance to prevent the loss of soil and maintain the performance of the Swale.

5.1.1 Inspection Frequency

The facility will be inspected and inspection visits will be completely documented:

- Once a month at a minimum.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation.)
- On a weekly basis during extended periods of wet weather.

5.1.2 Aesthetic and Functional Maintenance

Aesthetic maintenance is important for public acceptance of stormwater facilities. Functional maintenance is important for performance and safety reasons.

The following activities will be included in the aesthetic maintenance program:

- **Grass Trimming.** Trimming of grass will be done on the Swale, around fences, at the inlet and outlet structures, and sampling structures.
- **Weed Control.** Weeds will be removed through mechanical means. Herbicide will not be used because these chemicals may impact the water quality monitoring.

Functional maintenance has two components: Preventive maintenance and Corrective maintenance

Preventive Maintenance.

Preventive maintenance activities to be instituted at a Swale are:

- **Grass Mowing.** Vegetation seed mix within the Swale is designed to be kept short to maintain adequate hydraulic functioning and to limit the development of faunal habitats.
- **Trash and Debris.** During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.
- **Sediment Removal.** Sediment accumulation, as part of the operation and maintenance program at a Swale, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment reaches a level at or near plant height, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the Swale to design performance standards. Actions will include using additional fill and vegetation and/or removing accumulated sediment to correct channeling or ponding. Characterization and Appropriate disposal of sediment will comply with applicable local, county, state, or federal requirements. The swale will be regraded, if the flow gradient has changed, and then replanted with sod.
- **Removal of Standing Water.** Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas.

- Mechanical and Electronic Components. Regularly scheduled maintenance will be performed on fences, gates, locks, and sampling and monitoring equipment in accordance with the manufacturers' recommendations. Electronic and mechanical components will be operated during each maintenance inspection to assure continued performance.
- Fertilization and Irrigation. The vegetation seed mix has been designed so that fertilization and irrigation is not necessary. Fertilizers and irrigation will not be used to maintain the vegetation.
- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance.

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a Swale. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which impede the hydraulic functioning of a Swale and prevent vegetative growth, will be removed and properly disposed. Temporary arrangements will be made for handling the sediments until a permanent arrangement is made. Vegetation will be re-established after sediment removal.
- Structural Repairs. Once deemed necessary, repairs to structural components of a Swale and its inlet and outlet structures will be done within 10 working days. Qualified individuals (i.e., the designers or contractors) will conduct repairs where structural damage has occurred.
- Embankment and Slope Repairs. Once deemed necessary, damage to the embankments and slopes of swales will be repaired within 10 working days.
- Erosion Repair. Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance of a Swale. There are a number of corrective actions that can be taken. These include erosion control blankets, riprap, sodding, or reduced flow through the area. Designers or contractors will be consulted to address erosion problems if the solution is not evident.

- Fence Repair. Repair of fences will be done within 30 days to maintain the security of the site.
- Elimination of Animal Burrows. Animal burrows will be filled and steps taken to remove the animals if burrowing problems continue to occur (filling and compacting). If the problem persists, vector control specialists will be consulted regarding removal steps. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated. If the BMP performance is affected, abatement will begin. Otherwise, abatement will be performed annually in September.

5.1.3 General Facility Maintenance.

In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

Maintenance Frequency

The maintenance indicator document, included as Attachment J, lists the schedule of maintenance activities to be implemented at a swale.

Debris and Sediment Disposal

Waste generated in the swales is ultimately the responsibility of West Lilac Farms. Disposal of sediment, debris, and trash will comply with applicable local, county, state, and federal waste control programs.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria listed in the CCR, Title 22, Article 11.

The vegetation in the natural swales is expected to provide adequate bio-filtration. The advantage of the existing vegetation is that there is no maintenance required. The vegetation is already established, so it does not require regular watering. Intermittent off-season runoff will promote its viability.

5.2 Energy Dissipators

The operational and maintenance requirements for rip rap energy dissipators are as follows:

- Periodic inspection to assess the stability and performance of the energy dissipators and inlet aprons.
- Replacement of any rock outlet protection that has been washed away by large storms when necessary so the area is not susceptible to erosion.

Maintenance Frequency

The maintenance indicator document, included as Attachment J, lists the schedule of maintenance activities to be implemented at each energy dissipator.

6.0 FISCAL RESOURCES

The project owner is required to arrange for the maintenance and inspection of all private BMPs after construction is complete. After construction is complete and lots are sold, the new lot owners will assume the responsibility for maintenance of the private facilities. The designated responsible party may be the lot owners or an association of property owners whose fiscal resources are drawn from private funds or association fees.

The approval of the Tentative Map may be conditioned to require that, prior to the approval of a Final or Parcel Map, the subdivider shall provide evidence that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sale of lots, a notification regarding the maintenance requirements. There is no funding required for this condition.

The private roads which provide property access will be maintained by the property owners. Maintenance will be assured by a Private Road Maintenance Agreement (PRMA) between the property owners. The maintenance agreement will include provisions for litter and debris removal and pavement maintenance and repair. The PRMA will also include access and maintenance provisions for the vegetated swales and biofiltration areas. The vegetated swales and biofiltration areas will function as a filtering medium to effectively remove pollutants from the runoff including hydrocarbons, heavy metals, silt, debris, litter and vegetation.

A Stormwater Maintenance Program (SMP) for the long-term maintenance of the post-construction BMPs will be established in accordance with the County of San Diego Post-Construction BMP Categories. Setting the single-family residences back from the street and draining rooftops into landscaped areas is considered a Category One BMP because

the property owners will be expected to routinely maintain their landscape as incidental to taking care of their property. The proposed PRMA and vegetated swales are also considered Category One BMPs because the nature of these proposed BMPs indicate that it is appropriate for the property owners to be given the responsibility.

The County should have only minimal concern for ongoing maintenance. The proposed BMPs inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property. Therefore, the BMPs for West Lilac Farms are categorized as Category 1 and no funding is required for this category.

Mechanisms to assure maintenance of BMPs include the following:

1. Stormwater Ordinance Requirement: The County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (S.O.) requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.
2. Public Nuisance Abatement: Under the S.O. failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.
3. Notice to Purchasers: Section 67.819(e) of the SO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.
4. Conditions in Ongoing Land Use Permits: For those applications (listed in SO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the SMP. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.
5. Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

7.0 CONCLUSIONS

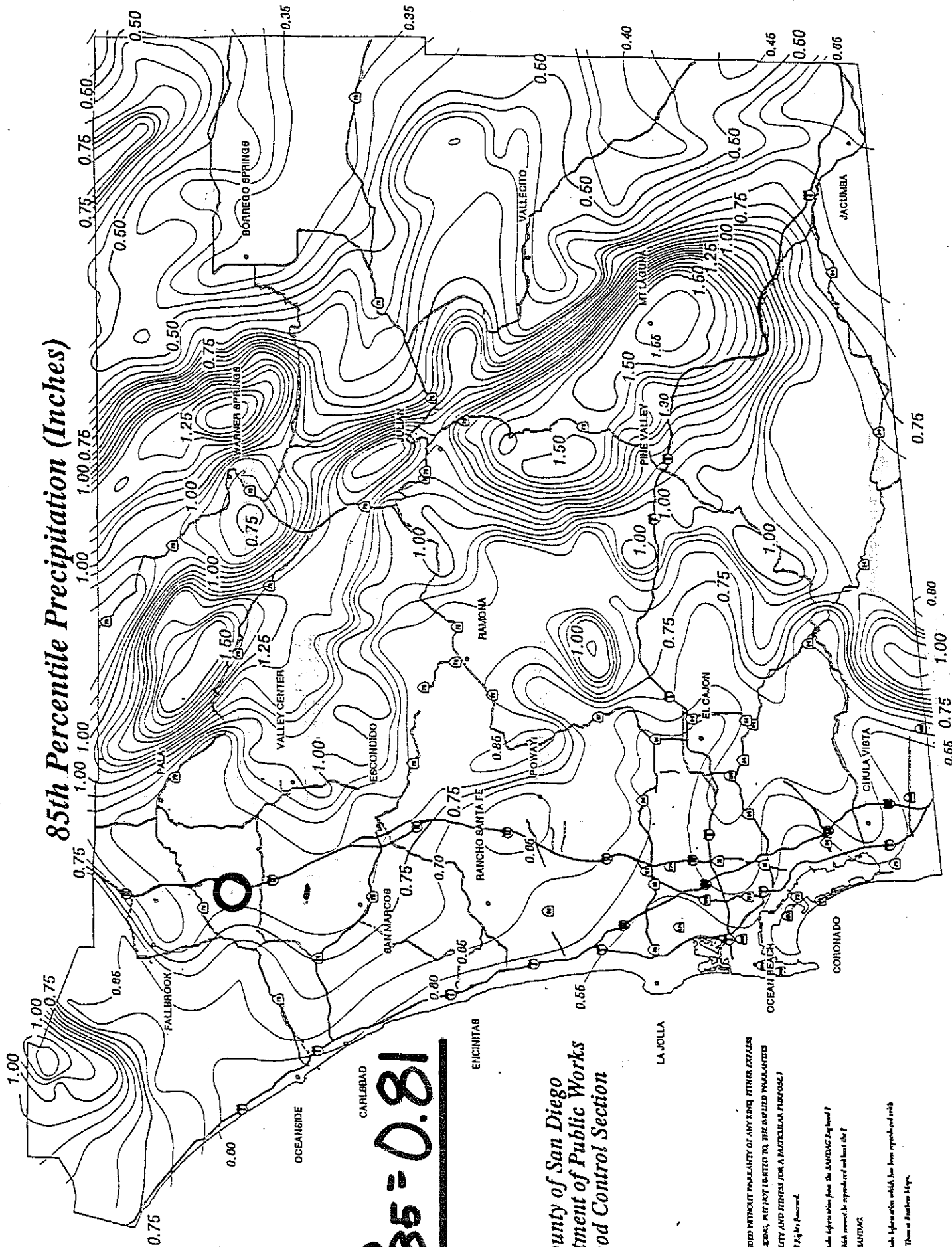
The potential pollutants associated with detached residential developments are presented in Table 5 on page 9 of this SWMP. ATTACHMENT G-3: Enhanced Treatment Control BMP Selection Matrix located in the Reference Section of this SWMP indicates that biofilters and filtration are effective BMPs for the removal of anticipated pollutants from detached residential developments. Therefore, there are no anticipated impacts to the beneficial uses of the Moosa Hydrologic Sub-Area (903.12) attributed to this proposed development. A summary of the facts and findings associated with this project and the measures addressed by this SWMP is as follows:

- The beneficial uses for the receiving waters have been identified. None of these beneficial uses will be impaired or diminish due to the construction and operation of this project.
- The West Lilac Ranch project will not significantly alter drainage patterns on the site. The discharge points will not be changed and riprap energy dissipaters will be placed to attenuate the flow velocities, thus preventing downstream erosion.
- The widening of Aqueduct Road and Via Ararat drive will not alter existing drainage patterns. The discharge points will not be changed and riprap energy dissipaters will be placed to attenuate the flow velocities, thus preventing downstream erosion.
- The existing vegetated swales as a part of the project will provide mitigation of the potential pollutants by providing opportunities for filtration and infiltration.
- The proposed construction and post-construction BMPs address mitigation measures to protect water quality and protection of water quality objectives and beneficial uses to the maximum extent practicable.

The combination of proposed construction and post-construction BMPs will reduce, to the maximum extent practicable, the expected pollutants and will not adversely impact the beneficial uses or water quality of the receiving waters.

8.0 REFERENCES

1. County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (S.O.)



85th Percentile Precipitation (Inches)

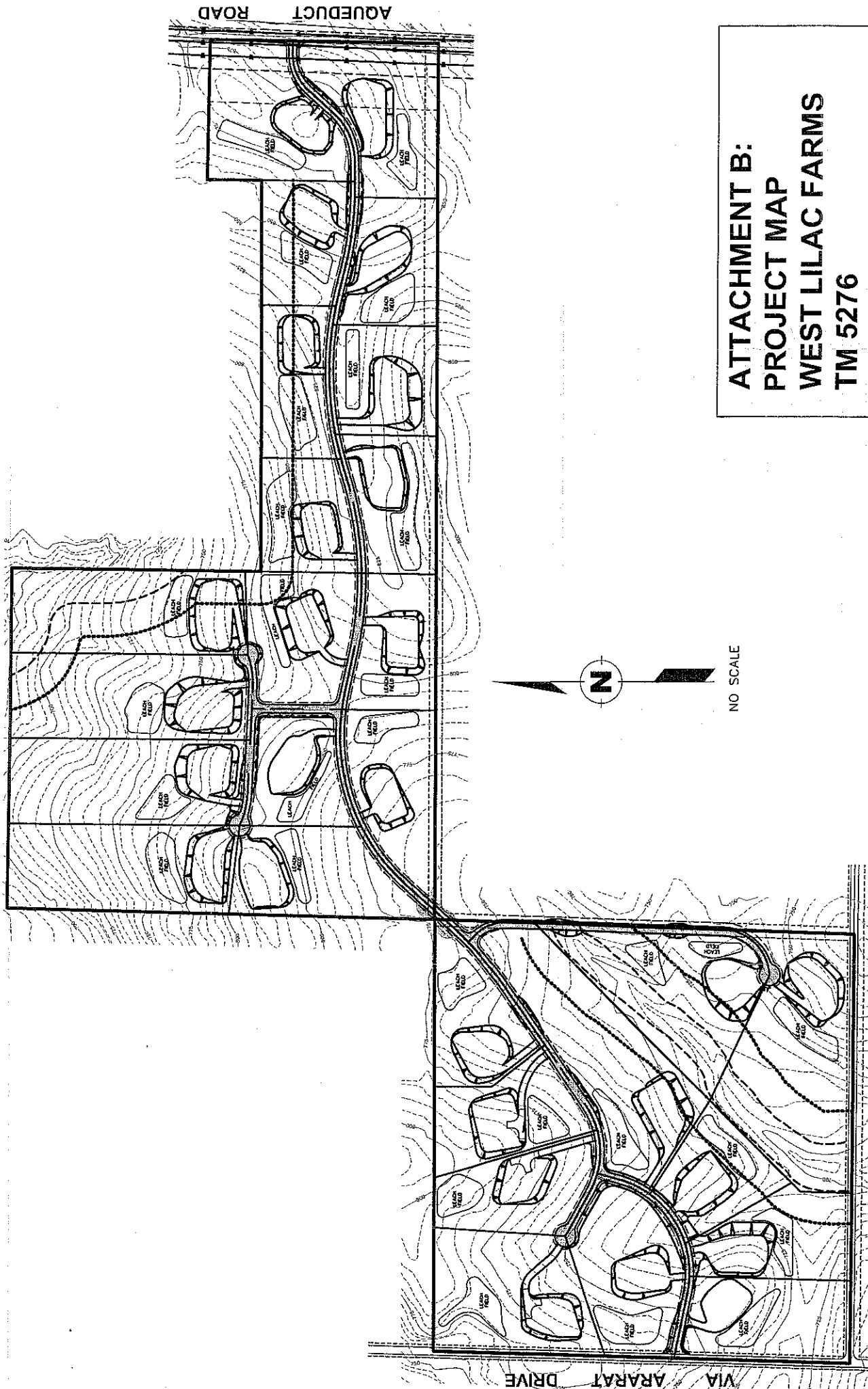
$P_{85} = 0.81$

County of San Diego
Department of Public Works
Flood Control Section

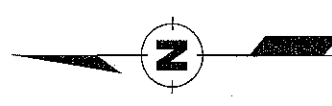
THIS MAP IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
Copyright © 1988 by the County of San Diego.

This product may contain information from the SANDAG Regional Flood Hazard Map. Information System which cannot be reproduced without the written permission of SANDAG.

This product may contain information which has been reproduced with permission granted by Thomas Brothers Maps.



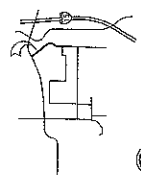
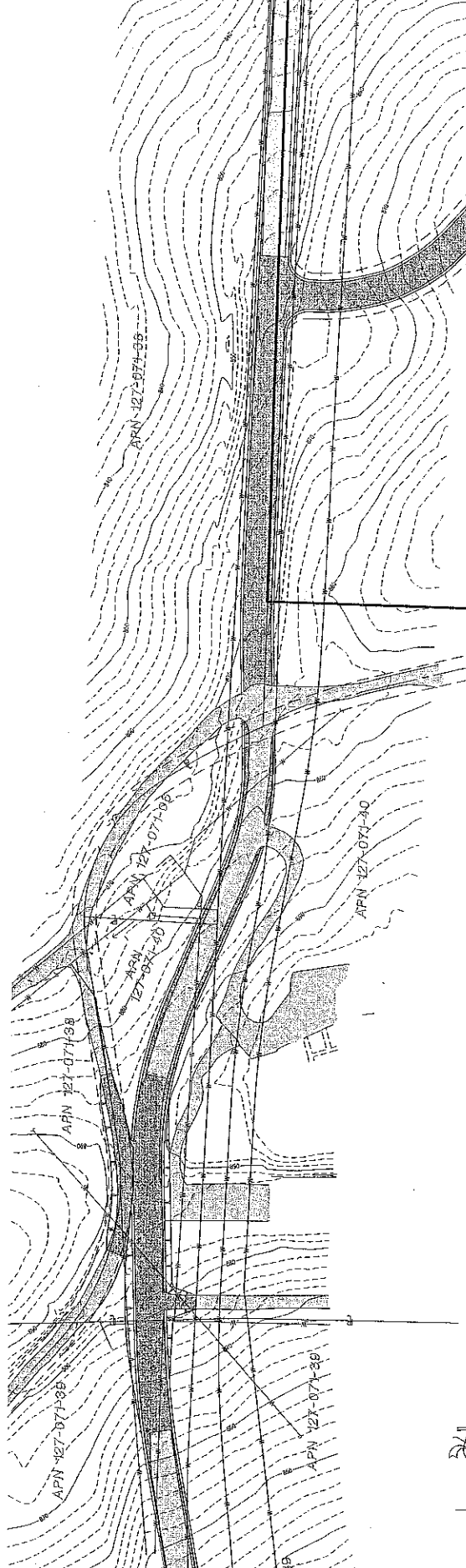
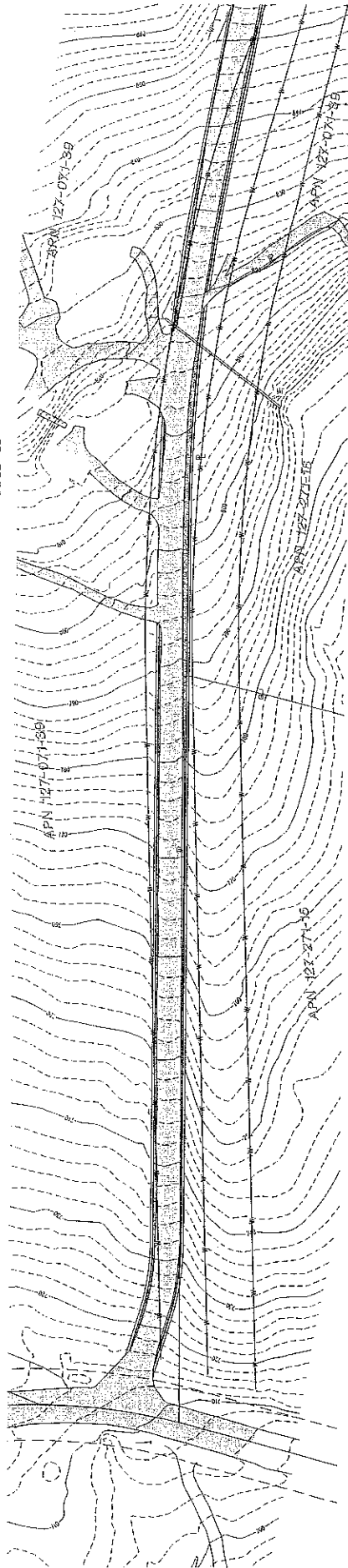
**ATTACHMENT B:
PROJECT MAP
WEST LILAC FARMS
TM 5276**



NO SCALE

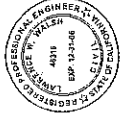
V:\Francis\01248\encl\Subgr7 Date en 6/27/2005 5:49:2 PM est

ATTACHMENT D: AQUEDUCT ROAD MAP



NO SCALE

PREPARED BY:



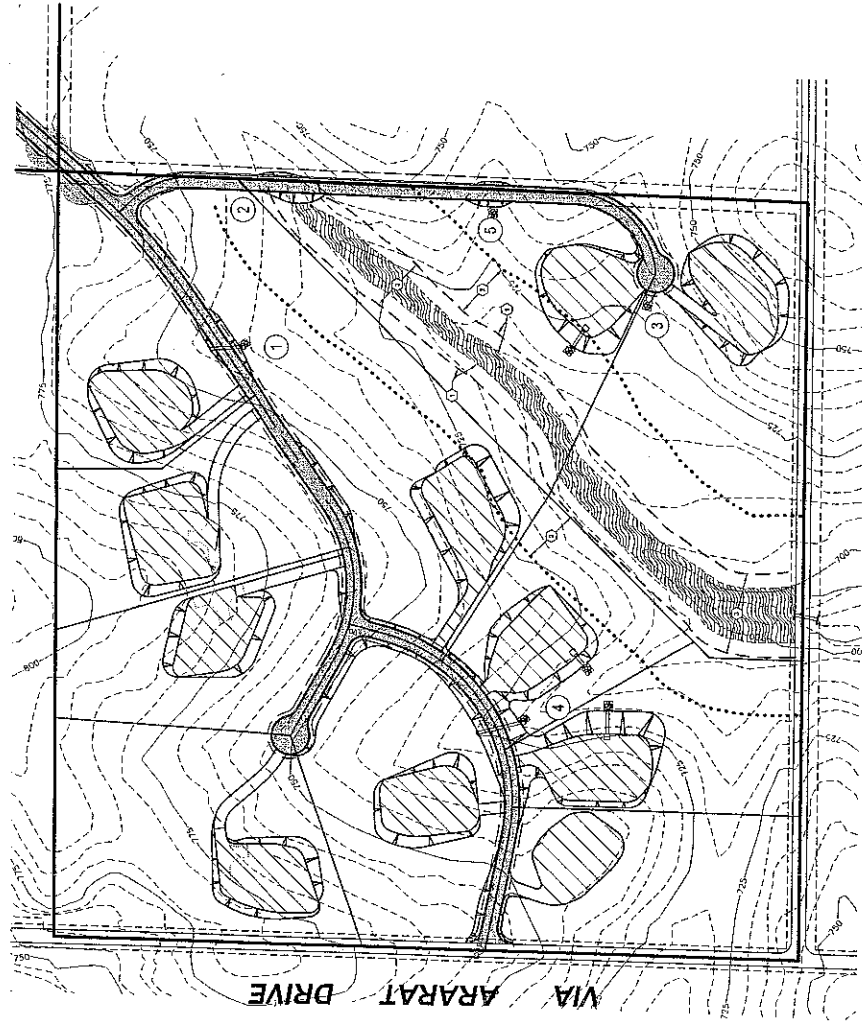
NO SCALE
THOMAS BRD. NO. 1048, D-7 & M-7
AND DEL. 1048, D-7 & M-7

LAWRENCE W. WALSH REG. 40319
Walsh Engineering & Surveying, Inc.
8475 Sycamore Drive, Suite 102, El Cerrito, CA 94530
(925) 433-1000 FAX (925) 433-1001

ATTACHMENT E: BMP PLANS

SHEET 1 OF 2

SEE SHEET 2

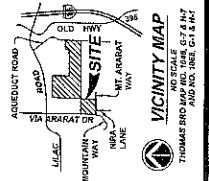


BMP NO.	BIOFILTRATION AREA
1	220 SF
2	100 SF
3	50 SF
4	140 SF
5	50 SF
6	50 SF
7	100 SF
8	140 SF
9	100 SF
10	50 SF
11	50 SF
12	175 SF

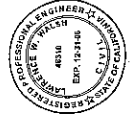
FUTURE LANDSCAPE AREAS FOR FILTRATION



- LEGEND**
- EXISTING WETLANDS (POLARIS CODE 8.1.2.2)
 - 24" DRAIN
 - PROPOSED 18" FINE CLEAVING OPEN SPACE EASEMENT
 - PROPOSED BIOLOGICAL OPEN SPACE EASEMENT



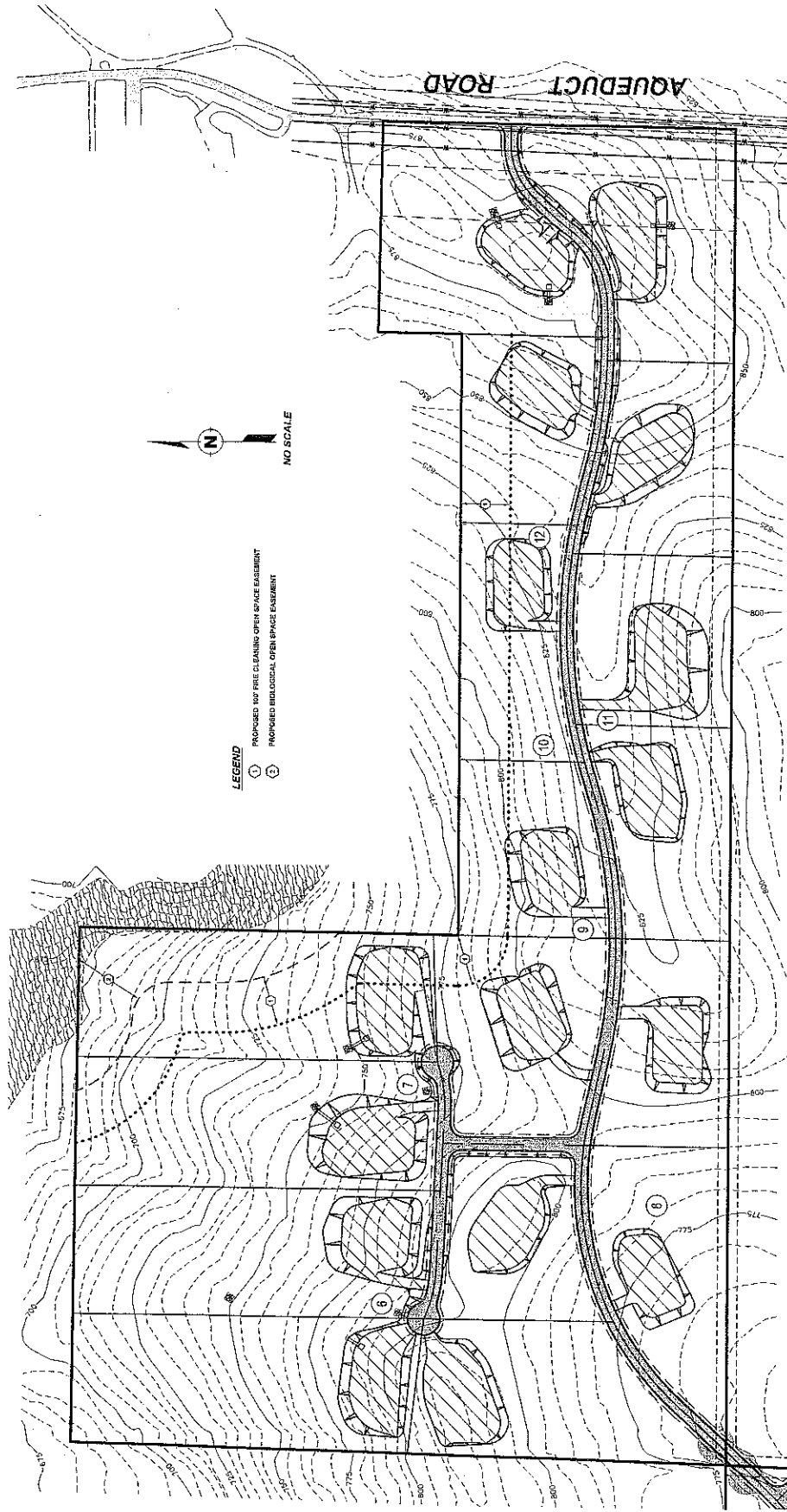
TENTATIVE MAP PREPARED BY:



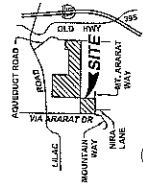
LAWRENCE WALSH ACE 4016 DATE
 Walsh Engineering & Surveying, Inc.
 1510 SHELTON COURT, Suite 100, L. J. CASH, CA 92029
 (619) 584-0472 (619) 446-7132 Fax

ATTACHMENT E: BMP PLANS

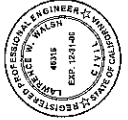
SHEET 2 OF 2



SEE SHEET 1



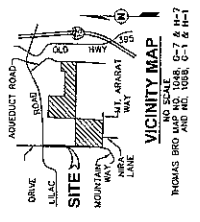
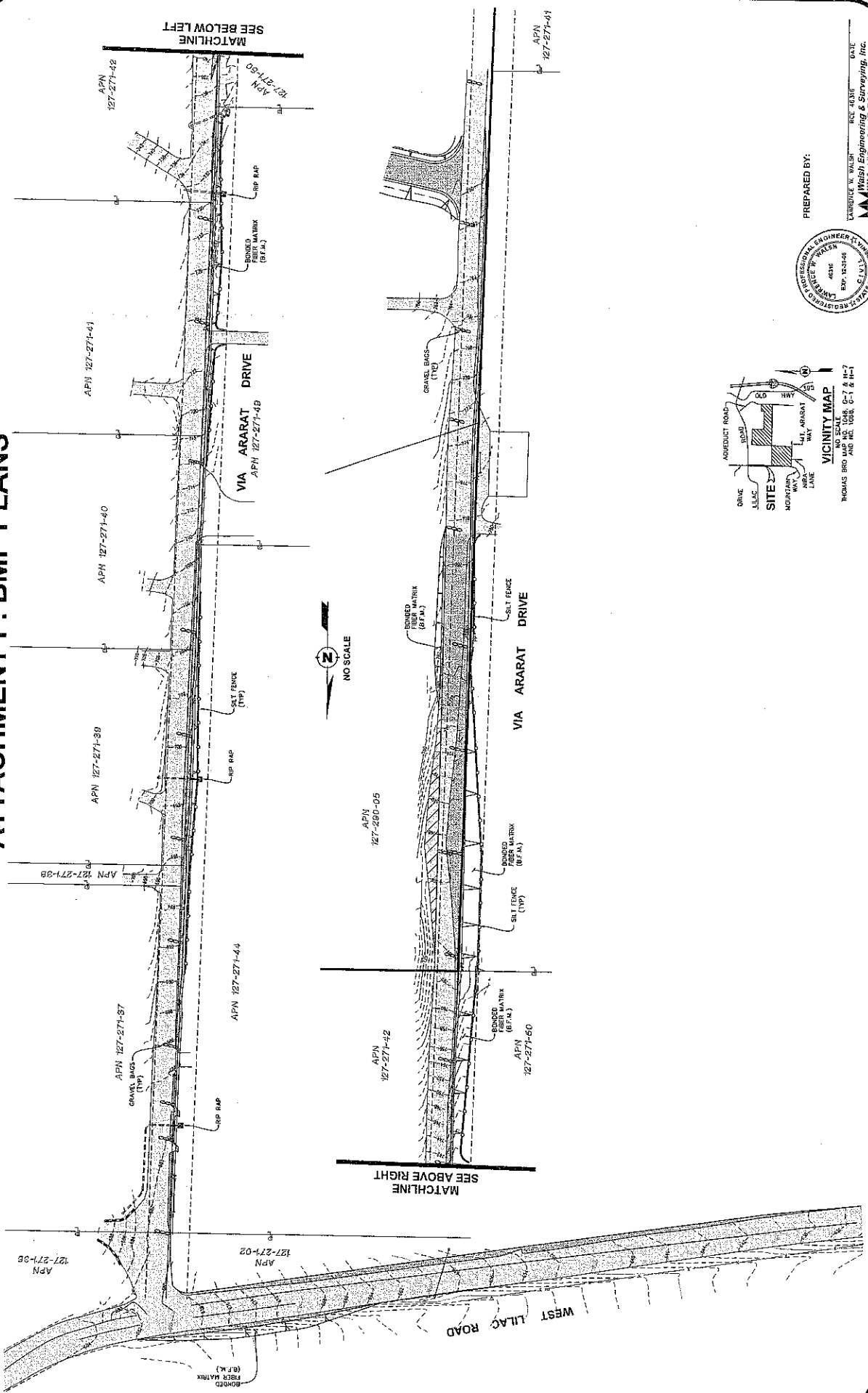
VICINITY MAP
 THOMAS BIRD MAP NO. 1046, 0-1-1-1
 AND NO. 1046, 0-1-1-1



TENTATIVE MAP PREPARED BY:

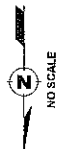
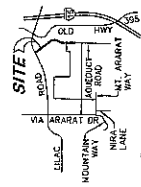
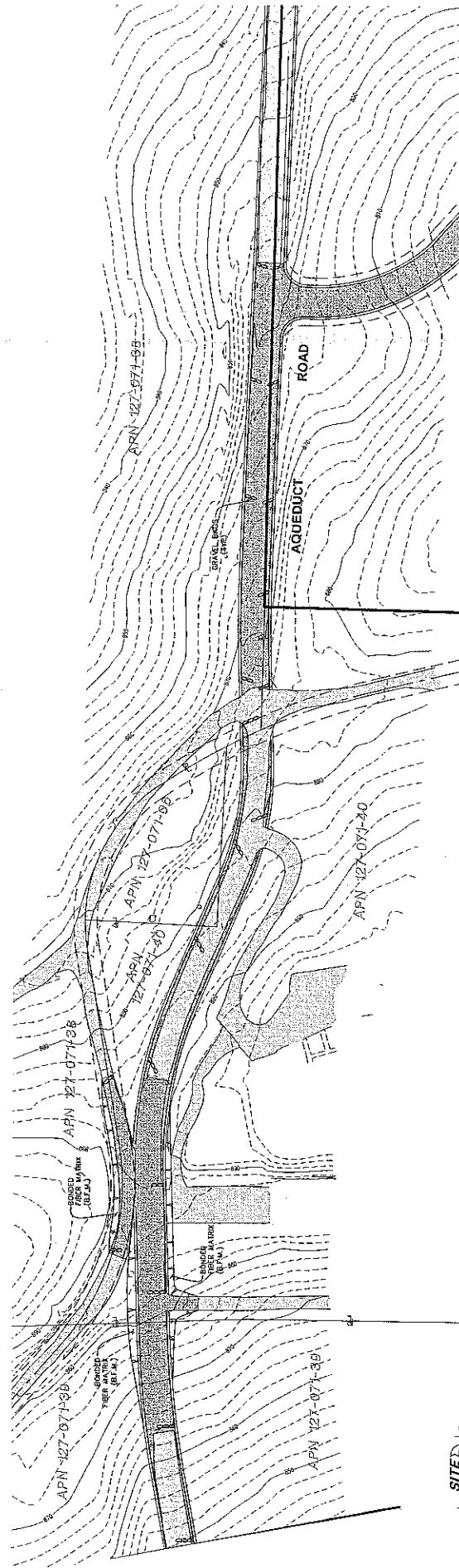
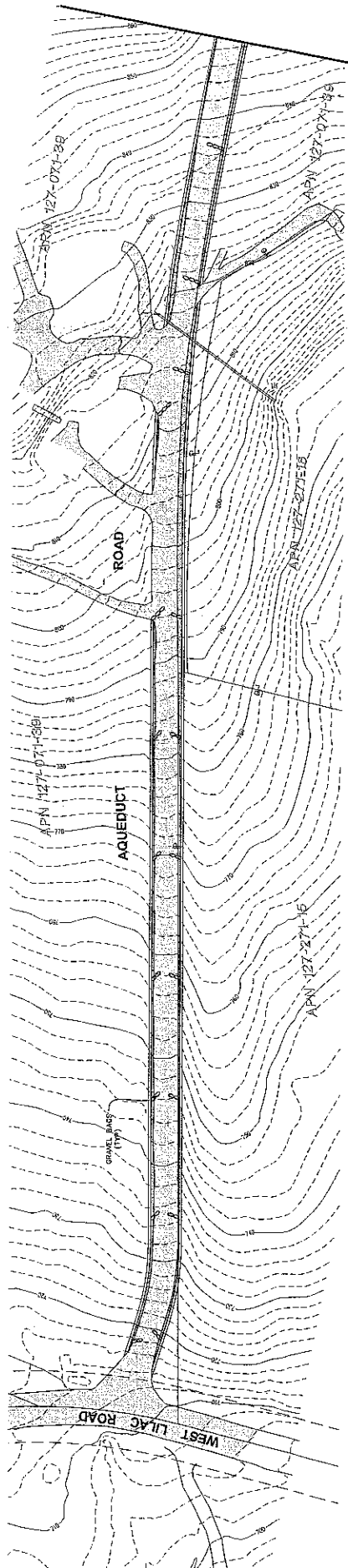
LAWRENCE W. WALSH REG. 48318 DATE
Walsh Engineering & Surveying, Inc.
 10000 Wilshire Blvd., Suite 300 E. Culver City, CA 90230
 (310) 556-8247 FAX (310) 556-8248

ATTACHMENT F: BMP PLANS



PREPARED BY:
LAWRENCE W. WALSH
REGISTERED PROFESSIONAL ENGINEER
CIVIL
4034
EXP. 12/30/08
Wulsh Engineering & Surveying, Inc.
1000 Central Expressway, Suite 100, San Jose, CA 95128
408.261.1212 Fax
408.261.1212

ATTACHMENT G: BMP PLANS



PREPARED BY:



Wald Engineering & Surveying, Inc.
10000 E. 1st Ave., Suite 100
Denver, CO 80231
(303) 555-7777 (303) 445-7121 Fax

PROTECTIVE DEVICES	INSPECT FOR:	MAINTENANCE MEASURES
Riprap-lined waterway	<ul style="list-style-type: none"> • Scour under riprap 	<ul style="list-style-type: none"> • Check construction. Install adequate protection.
Silt fence	<ul style="list-style-type: none"> • Undercutting of fence • Fence collapsing • Torn fabric • Runoff draining around barrier • Sediment level near top of fence 	<ul style="list-style-type: none"> • Fill undercut and re-compact. • Replace section. • Replace torn fabric. • Extend fence and/or regrade to prevent. • Remove sediment, dispose of properly.
Check dam	<ul style="list-style-type: none"> • Sediment accumulation • Flow escaping around sides of check dam • Displacement of sandbag, stones or straw bales 	<ul style="list-style-type: none"> • Remove sediment, dispose of properly. • Check construction, repair/restore as necessary. • Reconstruct per plan.
Inlet protection	<ul style="list-style-type: none"> • Flooding around or below inlet • Undercutting of bales or silt fence, bale displacement, torn fabric, etc. 	<ul style="list-style-type: none"> • Check grading/construction, check for clogging, restore for positive drainage into inlet. • Fill undercut and re-compact.
Outlet protection	<ul style="list-style-type: none"> • Dislodged stones • Erosion below outlet • Outlet scour 	<ul style="list-style-type: none"> • Restore erosion protection per plan. • Check construction. Repair accordingly. • Check construction. Repair accordingly.

EXHIBIT J:
BMP MAINTENANCE
INDICATOR
(1 of 2)

PROTECTIVE DEVICES	INSPECT FOR:	MAINTENANCE MEASURES
Vegetation	<ul style="list-style-type: none"> • Rills or gullies forming • Bare soil patches • Sediment at toe of slope 	<ul style="list-style-type: none"> • Inspect for adequate stand of vegetation, reseed. • Reseed bare areas. • Identify sediment source, control at source.
Dikes	<ul style="list-style-type: none"> • Gully on slope below dike • breach; low spot in dike • Loose soil • Erosion of dike face 	<ul style="list-style-type: none"> • Fill gully or low spot, re-compact. • Remove and re-compact. • Install adequate protection.
Swales	<ul style="list-style-type: none"> • Gully on slope below swale • Water ponded in swale • Sediment or debris in channel • Erosion of unlined channel surface • Erosion of channel lining 	<ul style="list-style-type: none"> • Fill gully, restore positive drainage. • Properly grade to provide positive drainage and prevent ponding. • Identify source of sediment or debris, install control measures at source. Remove sediment and debris from channel. • Install erosion protection. • Check construction. Install adequate protection.
Pipe slope drain or chute	<ul style="list-style-type: none"> • Blocked inlet or outlet • Runoff bypassing inlet • Erosion at outlet 	<ul style="list-style-type: none"> • Remove blockage. • Check construction, check for clogging, check grade for positive drainage into inlet. • Check construction. Install adequate protection.
Grassed waterways	<ul style="list-style-type: none"> • Bare areas • Tall growth 	<ul style="list-style-type: none"> • Re-vegetate bare areas. • Restore channel conditions per plan.



County of San Diego
STORMWATER MANAGEMENT PLAN

EXHIBIT K:
BMP DATA SHEETS
(1 OF 3)

This form must be submitted with all Grading Permit Applications.

SECTION 1. Required Information

Grading Permit Application Number:

Project Name: **W. LILAC FARMS**

Project address or location:

**SOUTH OF W. LILAC ROAD BETWEEN
VIA ARARAT DR. AND AQUEDUCT RD.**

APN #:

Name of project contact: **JAMES D. PARDEE, JR**

Phone # of project contact: **(805) 313-5555**

Estimated project start date:

NOT KNOWN

Estimated project finish date:

NOT KNOWN

Estimated grading start date:

NOT KNOWN

Estimated grading finish date:

NOT KNOWN

Estimated amount of disturbed acreage: **30⁺** acres (If equal to or greater than 5 acres, you must also provide a WDID number from the SWRCB.) WDID _____

Are there any watercourses or waterbodies within 50 feet of the limits of soil disturbance? YES _____ NO _____

SECTION 2. Best Management Practices

Best Management Practices

The goal of stormwater management planning is to reduce pollution to the maximum extent practicable by implementing Best Management Practices (BMPs). There are five categories of BMPs: 1) Erosion control practices, and; 2) Velocity reduction, and; 3) Sediment control practices, and; 4) Offsite sediment tracking control, and; 5) General site and materials management. BMPs from each of the five categories must be used together as a system in order to prevent erosion, sediment, wastes, spills, and residues from leaving the site. When properly implemented, monitored and maintained, BMPs will function to prevent pollutants (including sediment) from leaving the site. It is the responsibility of the property owner and the contractor to determine the types of BMPs that will be used, as well as the levels of application necessary to comply with the County's Stormwater and Grading Ordinances.

Best Management Practice Tables

Tables A and B (attached) must be used to indicate those BMPs that will be used to prevent stormwater pollution. At a minimum, the County requires that the BMPs listed in Table A be installed on all grading projects. However, some BMPs may not be applicable to every project. For example, if storm drain inlets are not present, then Storm Drain Inlet Protection (BMP CD40) would not be applicable.

Grading Plan Best Management Practice Checklist

The following information shall be shown on the grading plans:

- ☒ The project boundaries.
- ☒ The footprint of any existing structures and facilities.
- ☐ The footprint of all structures and facilities to be constructed.
- ☒ The limits of grading.
- ☒ The existing and proposed grades of the site, along with any intermediate grades that will significantly affect site drainage patterns.
- ☒ The location(s) where runoff from the site may enter storm drain(s), channel(s), and/or receiving waters.

Please note that each of the items identified by a star (*) in Tables A and B must be included on the grading plans, and labeled with the designation found in the tables (for example, CD26B).

SECTION 3. Certification

The following certification must be signed before a Grading Permit will be issued.

I have read and understand that the County of San Diego has adopted minimum requirements for stormwater management of construction activities. I certify that the BMPs I have selected in Tables A and B will be implemented to effectively minimize the potentially negative impacts of this project's construction activities on stormwater quality. I further agree to install, monitor, maintain or revise the selected BMPs to ensure their effectiveness.

I also understand that non-compliance with the County's Stormwater and Grading Ordinances may result in enforcement by the County, including fines cease and desist orders or other actions.

Property owner _____

Date _____

TABLE A: MINIMUM REQUIRED CONSTRUCTION BMPs

Minimum Required Best Management Practices	(*) If used, these BMPs must be shown on the grading plan.	CALTRANS Stormwater Quality Handbooks	California Stormwater BMP Handbook for Construction	Will BMP Be Used?		If No, State Reason
				Yes	No	
1. Erosion Control (select one or more as needed)						
Vegetation Stabilization Planting (see note 1)	*	CD24B	ESC10	X		
Hydraulic Stabilization Hydroseeding (see note 1)	*	CD24B	ESC10	X		
Bonded Fiber Matrix (see note 2)	*	CD25	ESC11	X		
Physical Stabilization Straw Blanket (see note 2)	*	CD26B CD43	ESC20	X		
Coconut Fiber Blanket (see note 2)	*	CD26B CD43	ESC20	X		
Geotextile Fabric (see note 2)	*	CD26B CD43	ESC20	X		
2. Velocity Reduction (select one)						
Energy Dissipator Outlet Protection (see note 3)	*	CD33A	ESC40	X		
3. Sediment Control (select one or more as needed)						
Silt Fence	*	CD36	ESC50	X		
Straw Wattles	*	-	-	X		
Gravel Bags	*	CD38	ESC52	X		
Storm Drain Inlet Protection	*	CD40	ESC54	X		
4. Offsite Sediment Tracking Control (select one or more as needed)						
Stabilized Construction Entrance	*	CD29A	ESC24	X		
Construction Road Stabilization	*	CD29B	ESC23	X		
Entrance / Exit Tire Wash	*	CD29C	ESC24	X		
Entrance / Exit Inspection & Cleaning Facility	*	-	-	X		
5. General Site Management (select one or more as needed)						
Materials Management Material Delivery & Storage		CD10	CA10	X		
Waste Management Concrete Waste Management		CD16	CA23	X		
Solid Waste Management		CD13	CA20	X		
Sanitary Waste Management		CD17	CA24	X		
Hazardous Waste Management		CD14	CA21	X		

Notes:

- When Planting or Hydroseeding are selected for erosion control, the vegetative cover must be established by October 1st. If in the opinion of the County Official the vegetative cover is not established by October 1st, additional hydraulic or physical erosion control BMPs will be required.
- These BMPs are temporary measures only when used without planting or hydroseeding. All slopes must have established vegetative cover prior to final grading approval.
- Regional Standard Drawing D-40 - Rip Rap Energy Dissipator is also acceptable for velocity reduction.

TABLE B: ADDITIONAL CONSTRUCTION BMPs

3/3

Additional Best Management Practices	(*) If used, these BMPs must be shown on the grading plan.	CALTRANS Stormwater Quality Handbooks	California Stormwater BMP Handbook for Construction	Will BMP Be Used?		If No, State Reason
				Yes	No	
Erosion Control						
Site Development Considerations Scheduling		CD22	ESC1	X		
Preservation of Existing Vegetation	*	CD23	ESC2	X		
Other -- (submit description for approval)	*					
Vegetation Stabilization Vegetation Buffer Strips	*	CD30	-	X		
Other (submit description for approval)	*					
Physical Stabilization Dust Control	*	-	ESC21	X		
Soil Stabilizers	*	CD26A		X		
Other (submit description for approval)	*					
Diversion of Runoff Earthen Dikes	*	CD31	ESC31	X		
Ditches and Berms	*	CD32B	-	X		
Slope Drains	*	CD32A	ESC32	X		
Temporary Drains & Swales	*	CD31	ESC31	X		
Other (submit description for approval)	*					
Velocity Reduction						
Check Dams	*	CD34	ESC41		X	N/A
Slope Terracing	*	CD35	ESC42		X	N/A
Other (submit description for approval)	*					
Sediment Control						
Brush or Rock Filter	*	CD39	ESC53		X	N/A
Sediment Trap	*	CD41	ESC55		X	↓
Sediment Basin	*	CD42	ESC56		X	↓
Other (submit description for approval)	*					
General Site Management						
Employee & Subcontractor Training		-	CA40			
Materials Management Spill Prevention & Control		CD12	CA12	X		
Other (submit description for approval)						
Waste Management Contaminated Soil Management		CD15	CA22		X	N/A
Other (submit description for approval)						
Vehicle and Equipment Management Vehicle & Equipment Cleaning		CD18	CA30	X		
Vehicle & Equipment Fueling		CD19	CA31	X		
Vehicle & Equipment Maintenance		CD20	CA32	X		
Construction Practices Water Conservation		CD4	-	X		
Structure Construction & Painting		CD9	CA3	X		
Paving Operations		CD8	CA2	X		
Dewatering Operations		CD7	CA1	X		
Other (submit description for approval)						

Estimated values derived from California Pilot BMP Study. This spreadsheet will change as additional data becomes available.														ESTIMATED ANNUAL COST		
BIOFILTER - STRIPS and SWALES	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS	Labor			Equipment			Materials		Total Cost	ANNUAL COST	
						Per. Hrs	Rate	Cost	Type	Days	Rate	Cost	Item			Cost
Preventive Maintenance and Routine Inspections																
ROUTINE ACTIONS	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	SITE SPECIFIC REQUIREMENTS											
Height of vegetation	Average vegetation height exceeds 12 inches, emergence of trees, or woody vegetation	Visual inspection of vegetation throughout strip/swale	Once during wet season, once during dry season (depending on growth)	Cut vegetation to an average height of 6 inches	Remove any trees, or woody vegetation.	10	43.63	436.3	one-ton truck & hydroseeder	2	26.84	53.68	slitting burner, pole saw, safety equipment	50	539.86	\$1080
Assess adequate vegetative cover	Less than 90 percent coverage in strip (wet/dry) or less than 90 percent on paved side slope	Visual inspection of strip/swale. Prepare a site schematic to record location and distribution of bare or browning spots to be restored. File the schematic for assessment of persistent problems	Assess quantity in May each year late wet season and late dry season.	Reseed/vegetate bare spots by Nov.		8	43.63	349.04	one-ton truck & hydroseeder	1	48.15	48.15	seed	150	512.19	\$1100
				Scalps are to be restored, to a depth of 2-inches. Restore side slope coverage with hydroseed mixture.		0	43.63	0	one-ton truck & hydroseeder	0	26.84	0			0	0
				If after 2 applications (2 seasons) of reseed/vegetating and growth is unsuccessful both lines, an erosion blanket or equivalent protection will be installed over eroding areas		0	43.63	0	one-ton truck & hydroseeder	0	26.84	0	blanket	0	0	0
Inspect for accumulated sediment	Sediment at or near vegetation height, channeling at flow, inhibited flow due to change in slope.	Visual observation	Annually	Remove sediment. If flow is channelled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment during dry season, channelize and properly dispose of sediment, and revegetate.		16	43.63	698.08	one-ton truck & hydroseeder	11	48.15	48.15	seed, testing and disposal of sediment	300	1046.23	\$350
				Notify engineer to determine if regrading is necessary. If necessary, regrade to design specification and revegetate swatch/strip. If regrading is necessary, the process should start in May. Revegetate strip/swale by Nov. Target completion prior to wet season.	None	2	43.63	87.26			0				87.26	\$90
General Maintenance Inspection	Outlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees, woody vegetation, fence damage, etc.	Visual observation	Semi-Annually, late wet season and late dry season.	Corrective action prior to wet season. Consult engineer if an immediate solution is not evident.	Remove any trees, or woody vegetation.	16	43.63	698.08	one-ton truck & hydroseeder	2	26.84	53.68			751.76	\$1500
TOTAL BIO FILTER AND SWALES						52		2265.76				203.66		500	2872.42	\$4120*

* For 28 Lot Subdivision \Rightarrow APPROX. \$150/OWNER PER BIOFILTER (ANNUALLY)
 \therefore FOR 12 BIOFILTRATION AREAS \Rightarrow APPROX. \$1800/OWNER = ANNUAL COST

EXHIBIT L:
 Estimated O & M Costs for
 BMP Project

ATTACHMENT G-3

Enhanced Treatment Control BMP Selection Matrix

Pollutant of Concern	Treatment Control BMP Categories						
	Biofilters	Detention Basins	Infiltration Basins ⁽²⁾	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Continuous Flow Deflection Systems ⁽³⁾
Sediment	M	H	H	H	M	H	M
Nutrients	L	M	M	M	M	M	L
Heavy Metals	M	M	M	H	M	H	L
Organic Compounds	U	U	U	U	L	M	L
Trash & Debris	L	H	U	U	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	U	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	U	L	U	L

(1) The County will periodically assess the performance characteristics of many of these BMPs to update this table.

(2) Including trenches and porous pavement.

(3) Also known as hydrodynamic devices and baffle boxes.

L (Low): Low removal efficiency

M (Medium): Medium removal efficiency

H (High): High removal efficiency

U: Unknown removal efficiency, applicant must provide evidence supporting use

Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), and *Guide for BMP Selection in Urban Developed Areas* (2001).

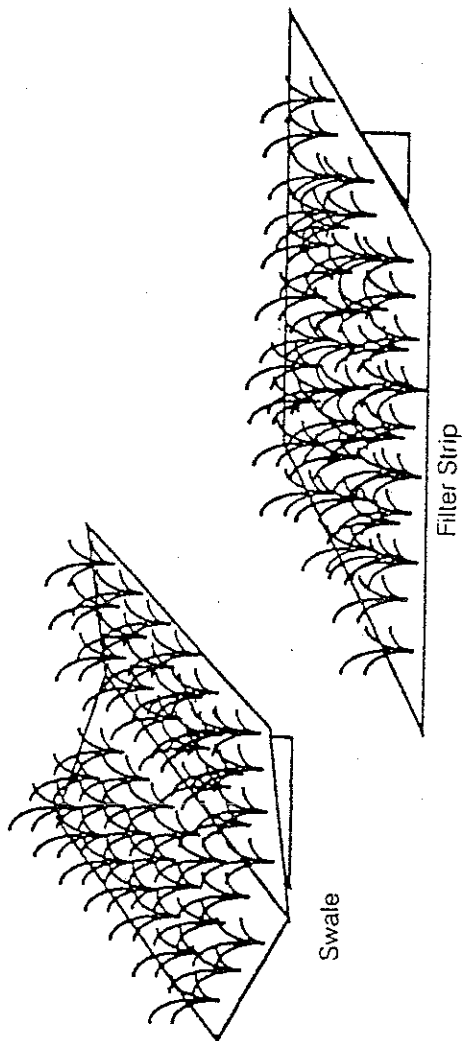


Figure 12.4—Swales and filter strips as controls: efficiency—moderate; function—slow runoff rate, some filtering and infiltration; maintenance-intensive (mowing); sideslopes of swales must be kept flat.

EXHIBIT N:
Typical Section
Bio-Filtration Area